REMARKS

This amendment is in response to a first Office action (Paper No. 5) dated October 2, 2002. Upon entry of this amendment, claims 1-5, 7 and 9-23 will be pending in this application. Applicant has canceled claims 6 and 8 without prejudice or disclaimer as to their subject matter by this amendment, amended claims 1-5, 7, 9, 10, 12, 14 and 15 by this amendment and newly added claims 17-23 by this amendment.

In Paper No. 5, the Examiner rejected claims 1, 3-6, 9 and 11 under 35 U.S.C. § 102 (e) as being anticipated by Shimojoh *et al.,* U.S. Patent No. 6,344,914. The Examiner also rejected claims 7, 8, 10 and 12-16 under 35 U.S.C. § 103 (a) as being unpatentable over Shimojoh '914. The Examiner also rejected claims 1, 2, 4, 5, 6 and 6 under 35 U.S.C. § 103 (a) as being unpatentable over Duck *et al.,* U.S. Patent No. 5,808,763. Applicant has amended independent claims 1, 4 and 5 and has amended depending claims 2, 3, 7, 9, 10, 12, 14 and 15 making these rejections moot.

Applicant has also newly added independent method claim 17 and depending claims 18-23 by this amendment. Under 37 C.F.R. § 1.111 (b) & (c), the Applicant has the following remarks:

1. The applied prior art does not teach or suggest a concave lens used to disperse a collimated optical signal into a signal spanning a range of wavelengths and 2. Applicant

need not know beforehand which wavelengths are present in the WDM optical signal.

Applicant has an input portion prior to when the optical signals enter the Fabry Perot etalon. This input section has a lens on the end of the optical fiber to collimate the optical signals. This input part also has a cylindrical concave lens to disperse or split the beam into a continuous range of angles, said range being about 10 degrees. Applicant submits that these features are neither taught or suggested by the applied prior art.

Shimojoh '914 does not teach dispersing an input beam into a range of angles. Furthermore, Applicant submits that Shimojoh '914 does not teach or suggest splitting an input beam into a plurality of discrete incident angles as alleged by the Examiner in Paper No. 4. Shimojoh '914 teaches an equalizer. In Shimojoh '914, a series of repeaters causes some wavelengths of an optical signal to be amplified more than other wavelengths, resulting in the output signal to have a spectral composition that is different than the input signal. In order to correct this, Shimojoh '914 teaches inputting the signal through a series of 3 filters in seriatim in order to bring the intensity for each wavelength of a wavelength division multiplexed signal to equal the spectral composition of the input signal. Although the optical signal input to each filter can be at an angle, and in fact, this angle can be adjusted or programmed, the entire incident beam enters each filter at only one particular angle rather than at a plurality of different angles or at a span of angles.

Duck '763 discusses, in the discussion of FIGS. 1 and 2, that one method for demultiplexing a beam of light is to split the beam into a plurality of discrete angles and then pass each of the plurality of resulting beams through a filter. However, Duck '763 teaches away from this notion of splitting as unnecessary power is lost (see column 4, lines 21-24 of Duck '763). This is because Duck '763, like Shimojoh '914 is not monitoring a signal, but instead, is processing a signal for further processing and transmission. Therefore, Duck '763 teaches that it is preferable not to split the signal into many parts prior to being filtered so the signal doesn't have to go through unnecessary attenuation. Also, Duck '763 knows the wavelengths that are being transmitted, so that a splitter can be designed so that the optical beam in FIGS. 1 and 2 are splitted into a number of beams, each at a different incident angle where the number of beams corresponds to the number of wavelength components that make up the beam. Therefore, Duck '763 is used only when the wavelengths that make up the WDM signal are known beforehand, unlike Applicant's claimed invention.

In Applicant's claimed invention, Applicant's monitoring device and method can be used to determine which wavelengths are present in a WDM beam even if the wavelengths that comprise the beam are not known prior to detection, provided that the wavelength components are within a certain range. Secondly, Applicant uses a concave lens to disperse the beam over a continuous range of angles and then amplifies the output from the etalon prior to detection. Applicant need not know the exact wavelengths of the components of the optical signal beforehand. Also, Applicant has no further purpose for the signal except to detect the signal to

noise ratio and the spectral components of the optical signal. Thus, Applicant's invention does not care if the signals are heavily attenuated at some point, rendering Duck '763 to teach away from Applicant's claimed invention. Furthermore, Applicant's setup can discover what wavelengths are present in a WDM signal without knowing the spectral composition beforehand. Therefore, the purpose and construction of Applicant's invention is neither taught nor suggested by the applied prior art.

Applicant has also added more specific features to the claims, such as the width of the etalon, the free spectral range of the etalon and the resolution and the range of angles and the range of wavelengths that are monitored. These features are neither taught or suggested by the applied prior art.

Entry of and favorable examination of Applicant's amendments and newly added claims is respectfully requested.

A fee of $102.00 is incurred by the addition of one (1) independent claims in excess of 3 and one (1) total claims in excess of total 20. Applicant's check drawn to the order of Commissioner accompanies this Amendment. Should the check become lost, be deficient in payment, or should other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

In view of the above, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Reconsideration of the rejections and objections is requested. Should any questions remain unresolved, the Examiner is requested to telephone Applicant's attorney.

Respectfully submitted,

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MARKED-UP VERSION OF AMENDMENTS

IN THE CLAIMS

Please cancel claims 6 and 8 without prejudice or disclaimer as to their subject matter by this amendment, amend claims 1-5, 7, 9, 10, 12, 14 and 15 by this amendment and newly add claims 17-23 by this amendment as follows:

1. (Amended) An optical [filter] channel monitoring apparatus, comprising:

an input unit comprising a lensed fiber [for] receiving a wavelength division multiplexed (WDM) optical signal via an optical transmission medium and producing a collimated beam of optical signals, said input unit further comprising a concave lens receiving said collimated beam and outputting a plurality of optical signals that have [different] a continuous range of incidence angles according to the wavelengths each of said plurality of optical signals; and

a filter for receiving said plurality of optical signals from the input unit and separating the WDM optical signal into a [pluraltiy] plurality of optical signals having different wavelengths using the difference between resonance lengths according to the [different incidence] incident angles.

2. (Amended) The [optical filter] apparatus of claim 1, [wherein a lens is used as the input unit] further comprising an array of detectors receiving optical signals output by said filter and converting said optical signals into electrical signals, each detector being positioned to pick up a specific wavelength of incident radiation emanating from the filter, said apparatus further

comprising a microprocessor calculating signal to noise ratio and spectral components of said optical signals output from said filter.

3. (Amended) The [optical filter of] apparatus claim [1] 2, [wherein] an etalon is used as the filter.

4. (Amended) An optical channel monitoring apparatus, comprising:

an input part receiving a multiplexed, collimated optical signal and dispersing said collimated optical signal via a concave lens into a beam having different incident angles;

an optical filter [for] receiving [a] the wavelength division multiplexed (WDM) optical signal having different incident angles from the input part and [from an optical transmission medium, making the incidence angle of each wavelength of the WDM optical signal different from each other, and] separating the spanned WDM optical signal into a plurality of optical signals having different wavelengths using the difference between resonance lengths according to the different incidence angles; and

a [detector for] plurality of detectors, each detector being spatially positioned to receive incident radiation of a specific wavelength, said plurality of detectors detecting the intensity of each of said plurality of optical signals having different wavelengths and converting said optical signals to [as an] electrical [signal] signals.

5. (Amended) An optical channel monitoring method, comprising the steps of:

receiving a wavelength division multiplexed (WDM) optical signal from an optical transmission medium and outputting, via a concave lens, a plurality of optical signals [that have] spanning a continuous range of [different] incidence angles according to the wavelengths of the optical signals;

receiving said plurality of optical signals spanning said range of incident angles and separating the WDM optical signal [into a plurality of optical signals having different] according to wavelengths using the difference between resonance lengths according to the different incidence angles; and

detecting the intensity of each of said plurality of optical signals having different wavelengths and converting said intensity into a corresponding plurality of electrical signals.

7. (Amended) The [optical filter] apparatus of claim [6] 3, further comprising a beam size controller between said etalon and said detector to amplify said plurality of optical signals having different wavelengths in order to be detected by said [detector] array of detectors.

9. (Amended) The apparatus of claim 4, [further comprising an input unit for receiving said wavelength division multiplexed (WDM) optical signal via said optical transmission medium and outputting optical signals that have different incidence angles according to the wavelengths of the optical signals] said concave lens dispersing an input collimated WDM beam into a beam spanning a range of angles, said range of angles being about 10 degrees.

10. (Amended) The apparatus of claim 9, further comprising an optical amplifier [for] amplifying each of said plurality of optical signals having different wavelengths output by said filter allowing said plurality of optical signals having different wavelengths to be detected by [said detector] corresponding ones of said plurality of detectors.

12. (Amended) The apparatus of claim [4] 10, further comprising a microprocessor that determines the wavelength and the optical signal to noise ratio for each of said plurality of optical signals having different wavelengths from said plurality of electrical signals produced by said plurality of detectors [detector].

14. (Amended) The method of claim 13, further comprising the step of determining [the wavelength] spectral components and the optical signal to noise ratio [of each of said plurality] for each wavelength in said plurality of optical signals having different wavelengths by processing said plurality of electrical signals by said microprocessor.

15. (Amended) The method of claim 14, further comprising the step of amplifying said plurality of optical signals having different wavelengths immediately after separating said optical signals according to wavelengths and immediately prior to said detecting step [before said plurality of optical signals impinge on said detector].